इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 9891-1 (1981): Edge Connectors for Printed Wiring Board and Insulated Board Having a Contact Pitch of 2.54 mm, Part I: Test Schedule and Requirements [LITD 3: Electromechanical COmponents and Mechnical Structures for Electronic Equipment]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS : 9891 (Part I) - 1981

(Reaffirmed 2004)

Indian Standard

SPECIFICATION FOR EDGE CONNECTORS FOR PRINTED WIRING BOARD AND INSULATED BOARD HAVING A CONTACT PITCH OF 2·54 mm

PART I TEST SCHEDULE AND REQUIREMENTS

UDC 621·315·683 : 621·3·049·75 : 620·1 : 621·38·038

© *Copyright* 1982

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Rs 5·00 Gr 3 *February* 1982

IS : 9891 (Part I) - 1981

Indian Standard

SPECIFICATION FOR EDGE CONNECTORS FOR PRINTED WIRING BOARD AND INSULATED BOARD HAVING A CONTACT PITCH OF 2·54 mm

PART I TEST SCHEDULE AND REQUIREMENTS

Connectors for Electronic Equipment Sectional Committee, LTDC 16

Chairman	*Representing*
Brig N. Dayal	Ministry of Defence (DGI)
Members	
Lt Col Gurdev Singh (*Alternate* to Brig N. Dayal)	
Dr K. B. Aggarwal	Department of Electronics, New Delhi
Shri R. K. Chakravarti (*Alternate*)	
Shri Bakul Harishankar	Allied Electronics Corporation, Bombay
Shri S. B. Karnik (*Alternate*)	
Shri R. P. Balsara	Electronic Component Industries Association, New Delhi
Shri Bakul Harishankar (*Alternate*)	
Shri D. K. Bansal	Poly-Qual Engineeratics (India), New Delhi
Smt R. D. Kumar (*Alternate*)	
Shri M. R. Gogia	M C Gogia, Distt Thane
Shri K. B. Lall	Posts and Telegraphs, New Delhi
Shri Y. K. Pande (*Alternate*)	
Shri I. C. Mathur	Directorate of Technical Development and Production (Air), Ministry of Defence
Shri B. A. Shastry (*Alternate*)	
Dr K. M. Mathur	Hindustan Electrotechnology Pvt Ltd, Bombay
Shri A. K. Misra	Directorate General of Civil Aviation, New Delhi
Shri S. C. Duggal (*Alternate*)	
Shri R. Parthasarthy	Hindustan Aeronautics Ltd, Hyderabad
Shri B. A. Khan (*Alternate*)	
Lt Col Paul Verghese	Amphetronic Ltd, Pune
Shri T. K. Venugopal (*Alternate*)	

(*Continued on page* 2)

© *Copyright* 1982

INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(*Continued from page* 1)

Members	*Representing*
SHRI RAM SWARUP	National Physical Laboratory (CSIR), New Delhi
SHRI O. N. KHANNA (*Alternate*)	
SHRI P. V. RAO	Indian Telephone Industries Ltd, Bangalore
SHRI VIRESALINGAM (*Alternate*)	
SHRI C. S. SETHI	Gilard Electronics, Kota
SHRI R. SOMASEKHARA	Bharat Electronics Ltd, Bangalore
SHRI S. V. KABADE (*Alternate*)	
SHRI A. SUNDARA BABU	Ministry of Defence (R & D)
SHRI P. K. SHUKLA (*Alternate*)	
SHRI S. VEDANTHAM	Railway Board, Ministry of Railways
SHRI RAVI KUMAR (*Alternate*)	
SHRI R. C. JAIN, Head (Electronics)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI B. K. SHARMA
Assistant Director (Electronics), ISI

Indian Standard

SPECIFICATION FOR EDGE CONNECTORS FOR PRINTED WIRING BOARD AND INSULATED BOARD HAVING A CONTACT PITCH OF 2·54 mm

PART I TEST SCHEDULE AND REQUIREMENTS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 21 September 1981, after the draft finalized by the Connectors for Electronic Equipment Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 This standard (Part I) is one of the Indian Standards on low frequency connectors below 3 MHz used in electronic equipment and shall be used in conjunction with IS : 9647-1980 Specification for general requirements and methods of tests for low frequency connectors below 3 MHz including dc. Subsequent parts of this standard will cover detail specifications for specific types of connectors.

0.3 While preparing this standard, assistance has been derived from JSS 50805 Detail Specification for Connectors, Electrical, Printed Wiring Board and Insulated Board (Edge Connectors), issued by Directorate of Standardization, Ministry of Defence, India.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard specifies the test schedule and requirements applicable to edge connectors for printed wiring board and insulated board having a contact pitch of 2·54 mm.

---

*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.0 For the purpose of this standard, terms and definitions given in IS : 1885 (Part XL)-1974* and IS : 9647-1980† shall apply.

3. MATERIALS AND WORKMANSHIP

3.1 The materials used and workmanship shall be in accordance with **4** of IS : 9647-1980†.

4. TYPE DESIGNATION

4.1 Boards — The boards are identified by code letters as given below:

Board	*Code Letter*
Printed wiring board	W
Insulation board	I

4.2 Contacts and Terminals

4.2.1 A printed wiring board or insulated board on which plugs are mounted shall have a thickness between 1·40 mm and 1·88 mm.

4.2.2 A printed wiring board or insulated board on which plugs are mounted shall have a thickness between 1·60 mm aud 1·98 mm.

4.2.3 *Terminals* — The types of termination are identified by code letters as given below:

Type of Termination	*Code Letter*
Solder Termination	A
Wire wrap termination	B
Double wire wrap termination	C

4.3 A connector according to this standard is designated by:

i) Reference number to the Indian Standard,

ii) The letter IS represents Indian Standard,

iii) A number denotes the type of connector,

iv) Numbers denote the number of contacts or pins,

v) The letter W or I or WI denotes the use of connectors in particular board (*see* **4.1**),

vi) The letters A, B and C represent the type of termination used (*see* **4.2.3**), and

vii) T represents the thickness of the finish in micron.

---

*Electrotechnical vocabulary : Part XL Connectors.

†Specification for general requirements and methods of tests for low frequency connectors below 3 MHz including dc.

4.4 The type designation shall be given in accordance with **4.3**. For example:

XXXX IS – YY – ZZ – W/I-A/B/C – T

where

XXXX represents the reference number of Indian Standard (IS),

YY denotes the number allotted to the type of connector,

ZZ denotes the number of contacts,

W/I represents the use of printed wiring board/insulated board or both,

A/B/C represents the type of termination, and

T denotes the thickness of the finish in micron.

5. MARKING

5.1 The connectors shall be marked in accordance with **6** of IS : 9647-1980*.

6. CLIMATIC CATEGORY

6.1 The climatic category shall generally be chosen in accordance with **3** of IS : 9647-1980*.

6.2 The climatic category of a particular connector shall be specified in the relevant specification.

7. ELECTRICAL RATINGS

7.1 The rated voltage and rated current shall be specified in the relevant specification.

8. TESTS

8.1 General — The test schedule specifies the tests, the order in which they shall be carried out and the requirements to be met.

8.2 Conditions of Tests — The provisions of **8** of IS : 9647-1980* shall apply.

8.3 Classification of Tests — The provisions of **7** of IS : 9647-1980* shall apply.

8.4 Test Schedule

8.4.1 *Type Tests* — The test schedule for type tests, the sequence of tests and the number of samples shall be as specified in Table 1.

---

*Specification for general requirements and methods of test for low frequency connectors below 3 MHz including dc.

TABLE 1 SCHEDULE OF TYPE TEST

Test	Clause Ref of IS : 9647-1980*	Condition of Test	Requirement
1. All Samples (22 Samples)			
a) Visual examination	9	—	—
b) Dimensions and mass	10	—	—
c) Insertion & withdrawal force	14.1	—	—
d) Contact resistance	12.1	—	10 m Ohms (*Max*)
e) Voltage proof	12.5	3 times of rated voltage	—
f) Insulation resistance	12.4	—	5 000 M Ohms at 100 V (dc)
2. First Group (6 Samples)			
a) Soldering	13.15	—	—
b) Robustness of terminations	13.16	—	—
i) Tensile test	13.16.1	Force 40 N	—
ii) Bending test on tag terminations	13.16.2	Three bends	—
c) Acceleration (Steady)	14.10	170 m/s^2	—
d) Bump	14.11	4 000 Bumps, 40 g & duration 6 ms	—
i) Contact resistance	12.1	—	15 m Ohms (*Max*)
e) Vibration	14.13	10 to 2 000 Hz, 0·75 mm or 500 m/s^2 and duration 10 h	—
i) Visual examination	9	—	—
ii) Contact resistance	12.1	—	15 m Ohms (*Max*)
f) Shock	14.12	500 m/s^2	—
i) Contact resistance	12.1	—	15 m Ohms (*Max*)
g) Rapid change of temperature	16.4	—	—
i) Voltage proof	12.5	40 percent of initial test voltage	—
ii) Insulation resistance	12.4	—	100 m Ohms or 1 000 m Ohms
iii) Visual examination	9	—	—

*Specification for general requirements and methods of tests for low frequency connectors below 3 MHz including dc.

(*Continued*)

TABLE 1 SCHEDULE OF TYPE TEST — *Contd*

TEST	CLAUSE REF OF IS : 9647-1980*	CONDITION OF TEST	REQUIREMENT
h) Dry heat	16.2.1	Temp + 125°C	—
i) Visual examination	9	—	—
j) Damp heat, accelerated (first cycle)	16.2.2	—	—
i) Visual examination	9	—	—
k) Cold	16.2.3	Temp −40°C	—
i) Visual examination	9	—	—
m) Low air pressure	16.2.4	4·4 kPa	—
i) Voltage proof	12.5	40 percent of initial test voltage	—
n) Damp heat, accelerated (remaining cycle)	16.2.5	—	—
i) Voltage proof	12.5	40 percent of initial test voltage	—
ii) Insulation resistance	12.4	—	1 000 m Ohms (*Min*)
iii) Contact resistance	12.1	—	15 m Ohms (*Max*)
iv) Visual examination	9	—	—
3. Second Group (4 Samples)			
a) Damp heat (long term exposure)	16.3	Duration 21 days	—
i) Voltage proof	12.5	40 percent of the initial test voltage	—
ii) Insulation resistance	12.4	—	100 or 1 000 m Ohms (*Min*)
iii) Contact resistance	12.1	—	15 m Ohms (*Max*)
iv) Visual examination	9	—	—
4. Third Group (4 Samples)			
a) Mechanical endurance test	17	400 operation and 6 000 operation for reference contacts	—
i) Voltage proof	12.5	40 percent of initial test voltage	—
ii) Insulation resistance	12.4	—	100 m Ohms (*Min*)

*Specification for general requirements and methods of tests for low frequency connectors below 3 MHz including dc.

(*Continued*)

TABLE 1 SCHEDULE OF TYPE TEST — *Contd*

TEST	CLAUSE REF OF IS : 9647-1980*	CONDITION OF TEST	REQUIREMENT
iii) Contact resistance	12.1	—	15 m Ohms (*Max*)
iv) Insertion and withdrawal force	14.1	—	—
v) Visual examination	9	—	—
b) Electrical endurance test	18	1 000 h at 70°C	—
i) Voltage proof	12.5	40 percent of initial test voltage	—
ii) Insulation resistance	12.4	—	100 m Ohms (*Min*)
iii) Contact resistance	12.1	—	15 m Ohms (*Max*)
iv) Visual examination	9	—	—
5. Fourth Group (2 Samples)			
a) Mould growth	16.6	—	—
6. Fifth Group (2 Samples)			
a) Salt mist	16.7	—	—
i) Visual examination	9	—	—
ii) Insertion and withdrawal force	14.1	—	—
iii) Voltage proof	12.5	40 percent of the initial test voltage	—
iv) Insulation resistance	12.4	—	100 m Ohms or 1 000 m Ohms (*Min*)
v) *Contact resistance*	12.1	—	15 m Ohms (*Max*)
7. Sixth Group (2 Samples)			
a) Contact retention (insert)	14 4	—	—
i) Visual examination	9	—	—

NOTE — Two samples are as spares.

*Specification for general requirements and methods of tests for low frequency connectors below 3 MHz including dc.

8.4.2 *Routine Tests* — The following tests shall be carried out in the order stated:

a) Visual examination (*see* **9** of IS : 9647-1980*).

b) Voltage proof (duration 5 seconds) (*see* **12.5** of IS : 9647-1980*).

---

*Specification for general requirements and methods of tests for low frequency connectors below 3 MHz including dc.

8.4.3 *Acceptance Tests* — Two groups of samples (Group A and Group B) shall be selected (*see* Appendix B of IS : 2612-1965*) preferably at random from the lot that has passed routine tests stated in **8.4.2** above. Each group of connectors shall be subjected to the tests in the order given in Table 2.

TABLE 2 SCHEDULE OF ACCEPTANCE TESTS

TEST (1)	CLAUSE REF. OF IS : 9647-1980* (2)	AQL (PERCENT DEFECTIVE) (3)	INSPECTION LEVEL† (4)	D/ND‡ (5)
GROUP 'A'				
Insertion and withdrawal force	14.1	I	II	ND
Contact resistance	12.1			
Insulation resistance	12.2			
GROUP 'B'				
Sub-group 1				
Dimensions and mass	10	4	S-3	ND
Sub-group 2				
Mechanical endurance test	17	4	S-3	ND
Electrical endurance test	18			
Sub-group 3				
Soldering	13.14	4	S-3	D
Robustness of terminations	13.15			
Bump	14.11			
Climatic sequence	16.2			

NOTE — Samples which have been subjected to destructive tests shall not be returned to the lot.

*Specification for general requirements and methods of tests for low frequency connectors below 3 MHz including dc.

†Sampling plans and procedures for inspection by attributes for electronic items (*under preparation*).

‡D—destructive and ND — non-destructive.

---

*Recommendation for type approval and sampling procedures for electronic components.

INDIAN STANDARDS

ON

CONNECTORS FOR ELECTRONIC EQUIPMENT

IS:

1885 (Part XL)-1974 Electrotechnical vocabulary : Part XL Connectors

2926-1964 Dimensions of connectors for radio batteries

3720-1966 Dimensions of polarized plugs for hearing aids

3826 (Part I)-1966 Connectors for frequencies below 3 MHz : Part I General requirements and tests

3826 (Part II)-1970 Connectors for frequencies below 3 MHz : Part II Battery connectors for electronic equipment

5054-1980 General requirements and methods of tests for radio frequency connectors above 3 MHz (*first revision*)

9647-1980 General requirements and methods of tests of connectors below 3 MHz including dc

9891 (Part I)-1981 Edge connectors for printed wiring board and insulated board having a contact pitch of 2·54 mm : Part I Test schedule and requirements

9891 (Part II)-1981 Edge connectors for printed wiring board and insulated board having a contact pitch of 2·54 mm : Part II Plug types 9891 IS-01-11/25/33-W-A-0·75

9891 (Part III)-1981 Edge connectors for printed wiring board and insulated board having a contact pitch of 2·54 mm : Part III Plug types 9891 IS-02-11/25/33-I-A-0·75

9891 (Part IV)-1981 Edge connectors for printed wiring board and insulated board having a contact pitch of 2·54 mm : Part IV Socket types 9891 IS-03-11/25/33-W/I-A/B-0·75